Physics Student Study Guide

Subject area
General Physics.

Description
This is an A4 style study guide to accompany the text of the same name, written by two of the authors, and including a disk giving access to further, animated, examples via the Web.

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A-level, access.

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Summary Review

range: * very poor to ***** excellent	
Academic content	***
Usefulness to student	***
Usefulness to teacher	***
Meets objectives	****
Accuracy	*****

This text and accompanying disk are intended to provide support to US college students following a first course in general physics. The authors themselves stress that it is to be used as a resource after reading the text by the same name, written by two of the three co-authors of the guide.

Not having access to the text[1] I can only comment on the content of the support guide which appears to work well towards helping students understand concepts and develop their ability to solve problems. Given that the intended audience is US college students the content is more closely in line with the UK Advanced level physics syllabi, however this would also make it accessible to access or foundation students who are following a general physics course.

The text is made up of 32 chapters each of which follows the same format of Preview which gives a brief synopsis of the chapter, Quick reference which gives a glossary of terms and states the equations used, Discussion of selected sections which gives further notes and examples on the main chapter topic(s) and Practice problems which obviously provides opportunities for students to 'have a go' but also provides detailed solutions rather than simply answers.

The disk supplied with the text allows quick and easy access to a variety of Web based materials including additional tutorial problems and simulation exercises.

The text is calculus free and a student following this text should only need some basic algebra and trigonometry in order to follow the examples given. The level of physics required to proceed with this text is kept to a minimum and the concepts developed through the chapter - a good GCSE student in the UK could follow much of the material. The A4 format with a fair amount of white space and sensible use of language makes it easy to read, especially if used alongside lecture notes and the main text.

In terms of the content covered by the text however, I found it rather traditional, indeed I was taken by the similarity, with the exception of relativity and the quark model, of this text and my own A-level course book[2] of the mid-seventies.

I also have a problem with the use of units in this text. Why make a student take on SI, cgs and BE units in both the examples and practice problems? I certainly think UK students and tutors would be thrown by measuring mass in slug and force in pound or dyne.

On occasions I felt that the 'definitions' (in the glossary of the Quick reference section of a chapter) might lead to some confusion amongst students, e.g. , moment of inertia of an object is defined as "A rotational quantity which plays the same role as mass in linear motion". Whilst the equations for rotational and linear Kinetic Energy have similar form, $KE_{rot} = \frac{1}{2} I\omega^2$ and $KE_{lin} = \frac{1}{2}mv^2$, and I can be considered to be a constant of proportionality between Torque and angular acceleration in the way that mass can be considered a constant of proportionality between Force and linear acceleration, I feel that this is different from 'playing the same role'.

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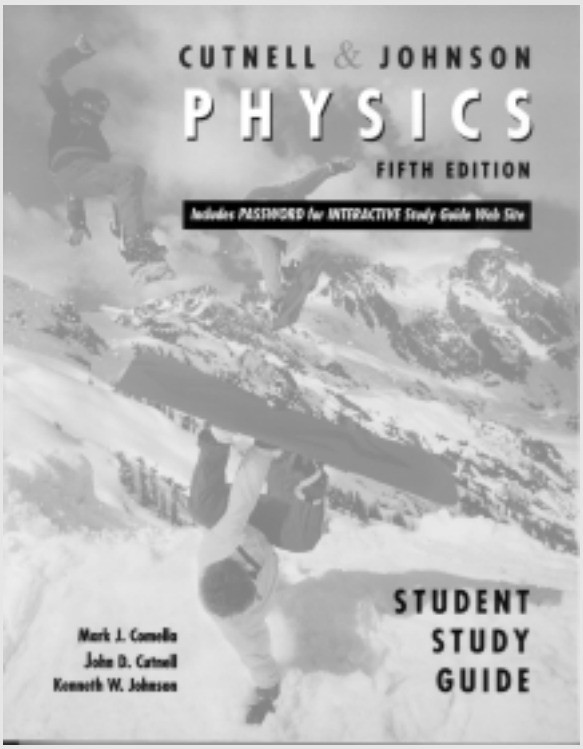
The random selection of problems that I attempted gave the text book answers and I would therefore argue that in this respect the text had been well proof read.

References
1. Cutnell, J. D. and Johnson, K. W., Physics Fifth Edition, John Wiley and Son, 2001
2. Nelkon, N. and Parker, P., Advanced Level Physics Third Edition, Heinemann Educational Books, 1970



From the publisher...

Physics Student Study Guide

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John D. Cutnell & Kenneth W. Johnson

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Given the problems of units and the need for a core text or lecture notes I am not sure how this text would work with a UK audience. Since the content is covered, in a less traditional way, to the same depth in GCE A-level texts, e.g. Duncan[3], then with the exception of the detailed solutions a student may be better directed to such a text.

The Web based material is a very useful addition but I was able to reach all the resources by following the links from; http://www.wiley.com/college/cutnell without the need for a password, which is supplied with the text. These are worth a look for instructional and self-study purposes especially the simulation exercises.

3. Duncan, T., Advanced Physics Fifth Edition, John Murray, 2000